



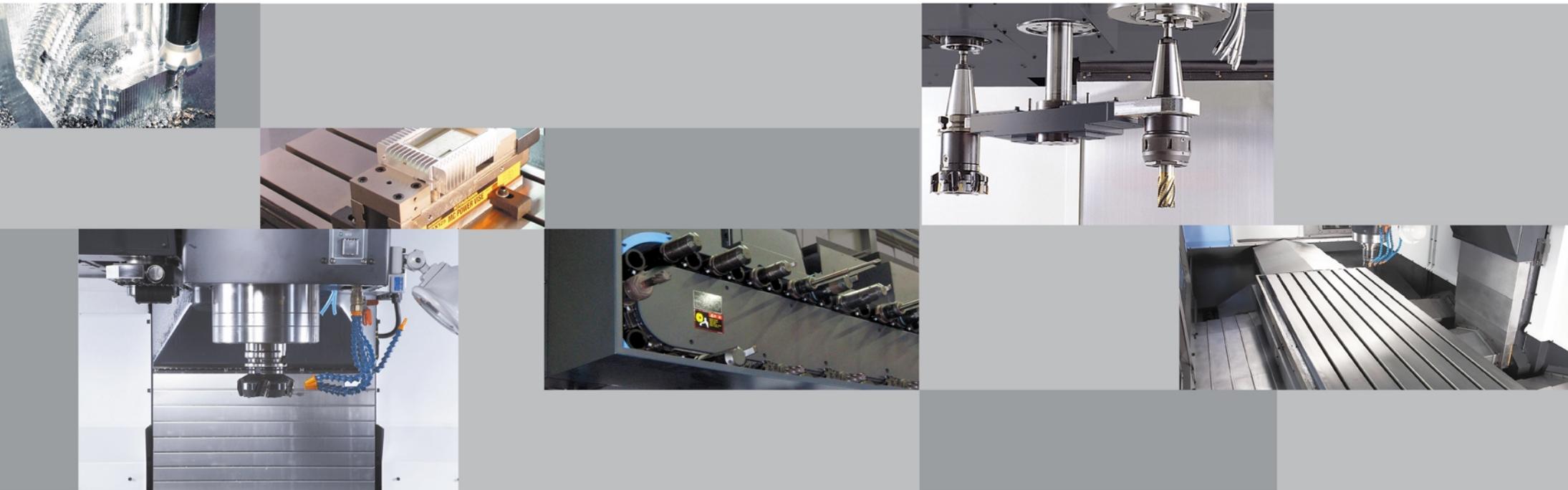
Doosan Infracore  
Machine Tools

# VM 560

Heavy Duty Vertical Machining Center



# Heavy Duty Vertical Machining Center



Powerful vertical machining center VM 560 is built to world-class standards to assure world-class results. Powerful drives, heavy duty construction, and unsurpassed rigidity provide exceptional precision and years of trouble-free performance.



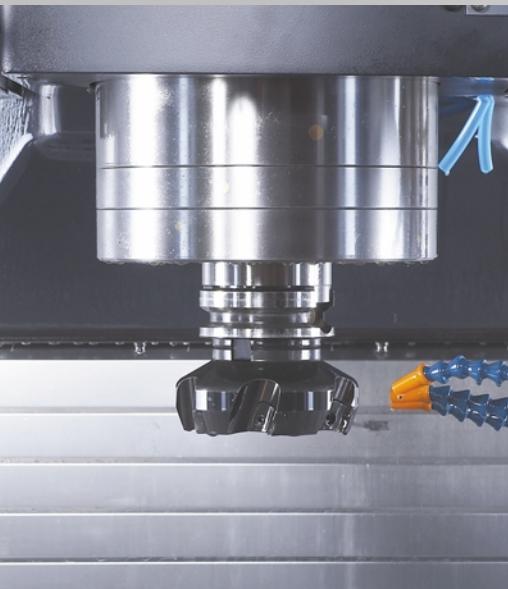
Vertical Machining Center

**VM 560**

# Speed Spindle

## VM 560 series

High speed spindle of high quality and rigidity helps increase the efficiency and performance of the machine.



### Speed Spindle

#### Built-in type

The built-in spindle motor and high grade balancing technology have virtually eliminated any vibration which deteriorate surface quality. The spindle is driven by a high power 22 kW (30 Hp) A.C. motor delivering an impressive 204 N·m (150.6 ft-lbs) torque.

#### Max. spindle speed

**12000 r/min**

#### Motor (continuous/15min)

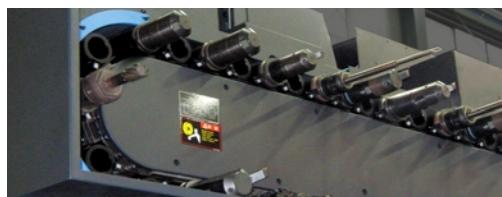
**18.5/22 kW  
(25/30 Hp)**

#### Oil mist lubrication



### Minimized Non Cutting Time

Faster tool change time using cam increases productivity than previous model.



#### Automatic tool changer

#### Tool storage capacity

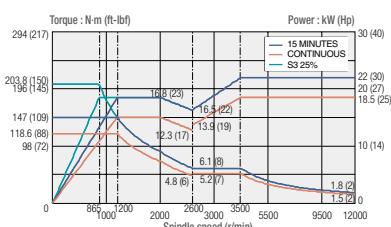
**30 tools**

#### Tool change time (T-T-T)

**3.0 s**

#### Spindle power-torque diagram

Standaard - 12000 r/min



#### Tool magazine

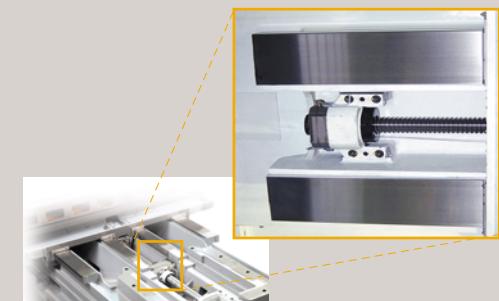
The 30 station, automatic tool changer accepts 50 taper tooling with a maximum tool weight of 15 kg (33.1 lb). Its reliable double-arm system provides 3.0 second tool-to-tool time. The maximum diameter tool size of 125 mm (4.9 inch) can be extended to 230 mm (9.1 inch) when adjacent pockets are empty. Tool loading positions are easily accessible, and movement of the bidirectional magazine can be manually controlled.

### Mechanical Structure

Strong structure and powerful processing capability!

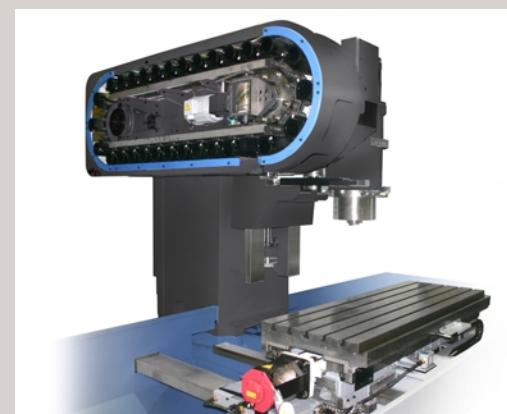
Structure of doosan's processing know-how!

It adopts the highly durable and wide bed slide side with deep and high frequency heat treatment and allows stable transport and processing with wide z-axis slide and wide support of y-axis.



#### Rigid boxway type

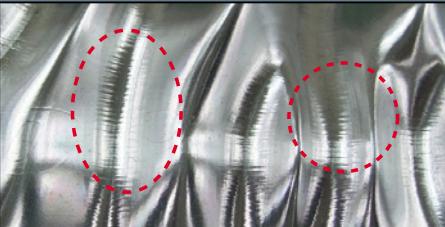
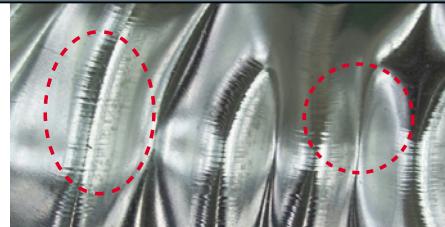
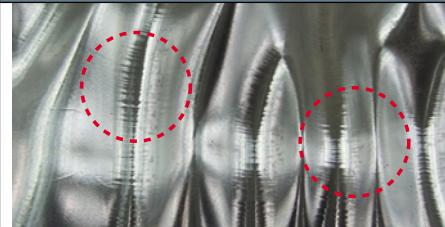
It offers quick and powerful location control by adopting the rigid boxway type guide and double-anchor support, high accuracy and large diameter ball screw.



# Doosan's Exclusive [DSQ] High Speed Precision Processing

DSQ-Xplus improves productivity and molding processing quality by allowing individual tuning customized to the machine, high speed processing of the large capacity program, and enhanced order complying capability on the basis of stable structure of Doosan VM Series.

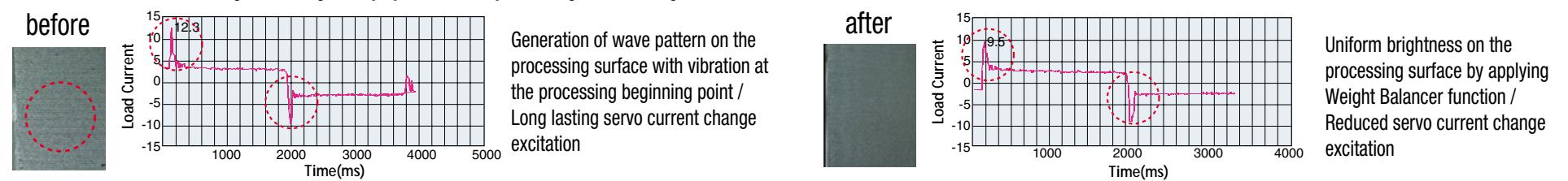
## Machining condition selection

Machining condition selection		Actual Application	
DOOSAN	Other Matters	DOOSAN	Other Matters
			
Roughing [21% time improvement]	Roughing [15% time improvement]	Finish Cutting [Better finish cutting quality compared to the competing products]	Finish Cutting [Finish cutting quality difference (insignificant)]

• By allowing the selection of the final processing condition, the processing quality and time are improved.

## Weight balancer

Maintenance of Uniform Molding Processing Quality by Automatically Detecting the Part Weight



## Oil Cooler Unit



Oil cooler unit to maintain the best spindle.

- Thermal displacement of the mandrel is minimized at the highest rotational speed (after 30 min. pre-heating)
- Since the oil jacket around the mandrel and heat generation parts of all moving units have the forced circulation of cooling lubricant of the oil cooling system, the whole mandrel maintains the uniform temperature to ensure high precision even during the high speed rotation.
- Temperature control within deviation of  $\pm 0.1^\circ$  is offered through the method of stopping the cooler using Daikin inverter oil-cooler and temperature control using other flow rate control.

Eco friendly & ergonomic



To apply the magazine approaching foot hold, the tool-setting is easy and convenient.



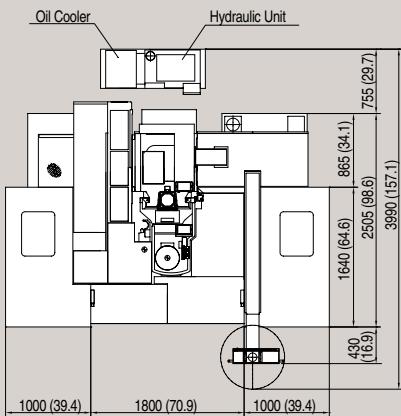
Arranged lubrication and public pressures system in one place and improved an inspection and maintenance.

# External Dimensions

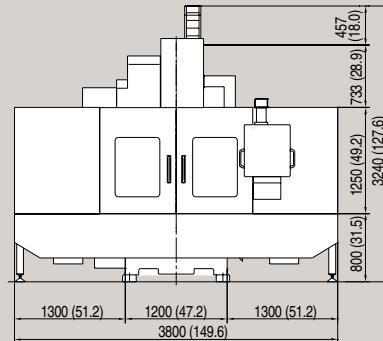
Unit : mm (inch)

**VM 560**

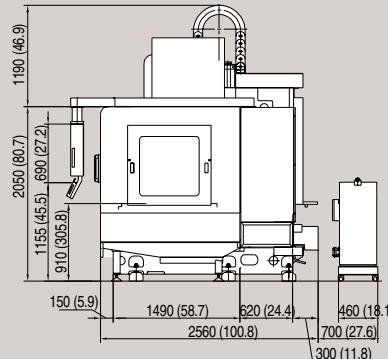
## Top View



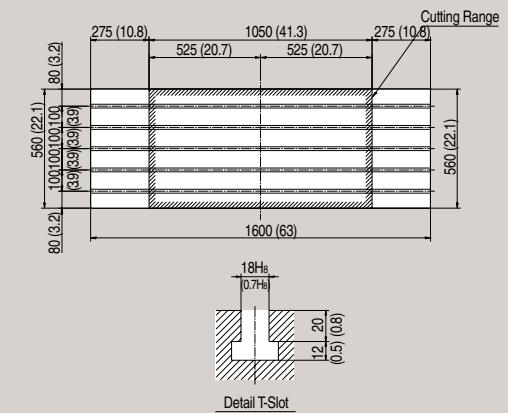
## Front View



## Side View



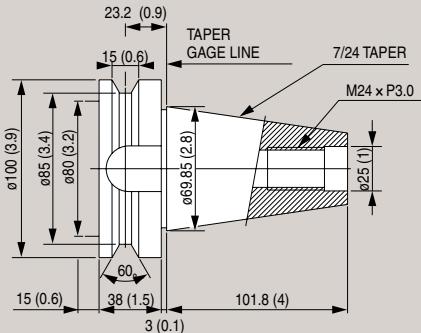
## Table



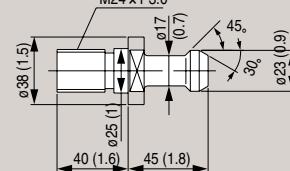
# Tool Shank

BT50

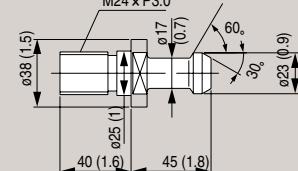
MAS403P BT 50 \_ Standard



MAS403P50T-I(45) \_ Standard



MAS403P50T-II(60) \_ Option



# Machine Specifications

Features			VM 560
Travel	X-axis (longitudinal movement of table)	mm (in.)	1050 (41.3)
	Y-axis (cross movement of saddle)	mm (in.)	560 (22.1)
	Z-axis (vertical movement of spindle head)	mm (in.)	560 (22.1)
	Distance from spindle nose to table top	mm (in.)	150 - 710 (5.9 - 28)
	Distance from spindle center to column guideway	mm (in.)	600 (23.6)
Table	Table size	mm (in.)	1600 x 560 (63 x 22.1)
	Table loading capacity	kg (lb)	1500 (3306.9)
	Table surface		5-100 x 18H
Spindle	Max. spindle speed	r/min	12000
	Spindle taper		ISO#50 7/24 Taper
Feedrate	Max. spindle torque	N·m (ft-lbs)	204 (150.6)
	Rapid traverse rate (X/Y/Z)	m/min (ipm)	30/30/24 (1181.1/1181.1/944.9)
	Cutting feedrate	mm/min (ipm)	12000 (472.4)
Automatic tool changer	Type of tool shank		MAS403 BT50
	Tool storage capacity		30
	Max. tool diameter	mm (in.)	ø125 (4.9)
	Max. tool diameter without adjacent tools	mm (in.)	ø230 (9.1)
	Max. tool length	mm (in.)	350 (13.8)
	Max. tool weight	kg (lb)	15 (33.1)
	Method of tool selection		Memory Random
	Tool change time (tool-to-tool)	s	3
	Tool change time (chip-to-chip)	s	6
	Spindle motor (15min)	kW (Hp)	22 (30)
Motor	Feed motor (X/Y/Z)	kW (Hp)	4.0 / 4.0 / 7.0 (5.4 / 5.4 / 9.4)
	Electric power supply (Rated Capacity)	kVA	60
Power source	Compressed air supply	Mpa (psi)	0.54 (78.3)
	Coolant tank capacity	L (galon)	600 (158.5)
Tank capacity	Lubrication tank capacity	L (galon)	3.1 (0.8)
	Machine height	mm (in.)	3240 (127.6)
Machine size	Machine dimension (L x W)	mm (in.)	3990 x 3800 (157.1 x 149.6)
	Machine weight	kg (lb)	9000 (19841.3)

## Standard Feature

- Assembly & operation tools
- Installation parts
- Screw conveyor
- Automatic power off
- Oil cooler & spindle cooling system
- Work light
- Coolant tank & chip pan
- Operator call lamp
- Full enclosure splash guard
- Portable 3MPG

## Optional Feature

- 4th axis preparation
- Chip bucket
- Through-the-spindle coolant system
- Automatic measuring system
- Electric power transformer
- Work light
- Automatic tool length measurement with sensor
- Flushing coolant
- Rotary table
- Chip conveyor
- Oil skimmer
- Test bar

• Design and specifications are subject to change without notice.  
• Doosan is not responsible for difference between the information in the catalogue and the actual machine.

# NC Unit Specifications (FANUC 18i-MB)

AXES CONTROL		
- Controlled axes	3 (X, Y, Z)	
- Simultaneously controllable axes		
Positioning (G00)/Linear interpolation(G01) : 3 axes		
Circular interpolation (G02, G03) : 2 axes		
- Backlash compensation		
- Emergency stop / overtravel		
- Follow up		
- Least command increment :	0.001mm / 0.0001	
- Least input increment :	0.001mm / 0.0001	
- Machine lock	all axes / Z axis	
- Mirror image		
Reverse axis movement (setting screen and M - function)		
- Stored pitch error compensation		
Pitch error offset compensation for each axis		
- Stored stroke check 1	Overtavel controlled by software	
TOOL FUNCTION		
- Cutter compensation C	G40, G41, G42	
- Number of tool offsets	64 ea	
- Tool length compensation	G43, G44, G49	
- Tool number command	T3 digits	
- Tool life management	Geometry / Wear and Length / Radius offset memory	
- Tool offset memory C		
PROGRAMMING & EDITING FUNCTION		
- Absolute / Incremental programming	G90 / G91	
- Auto. Coordinate system setting		
- Background editing		
- Canned cycle	G73, G74, G76, G80 - G89, G99	
- Circular interpolation by radius programming		
- Custom macro B		
- Custom size 256kb		
- Decimal point input		
- I/O interface	RS - 232C	
- Inch / metric conversion	G20 / G21	
- Label skip		
- Local / Machine coordinate system	G52 / G53	
- Maximum commandable value	± 9999.999mm (± 9999.999 inch)	
- No. of Registered programs	200 ea	
- Optional stop	M01	
- Part program storage	640 m	
- Program number	04-digits	
- Program protect		
- Program stop / end	M00 / M02, M30	
- Programmable data input		
Tool offset and work offset are entered by G10, G11		
- Sub program	Up to 4 nesting	
- Tape code	ISO / EIA Automatic discrimination	
- Work coordinate system	G54 - G59	
- Additional work coordinate system (48 Pair)		
G54.1 P1 - 48 pairs		
- Coordinate system rotation	G68, G69	
- Extended part program editing		
- Optional angle chamfering / corner R		
- Macro executor		
OTHERS FUNCTIONS (Operation, Setting & Display, etc)		
- Alarm display		
- Alarm history display		
- Clock function		
- Cycle start / Feed hold		
- Display of PMC alarm message	Message display when PMC alarm occurred	
- Dry run		
- Ethernet function (Embedded)		
- Graphic display	Tool path drawing	
- Help function		
- Loadmeter display		
- MDI / DISPLAY unit	9.5 mono LCD, Keyboard for data input, soft-keys	
- Memory card interface		
OPTIONAL SPECIFICATIONS		
- 3-dimensional coordinate conversion		
- 3-dimensional tool compensation		
- 3rd / 4th reference return		
- Addition of tool pairs for tool life management	512 pairs	
- Additional controlled axes	max. 6 axes in total	
- Additional work coordinate system	G64.1 P1 - 300 (300 pairs)	
- HPCC* (High Precision Contour Control)	with Risc180 block preview	
- AI HPCC* (High Precision Contour Control)	with 64 bit Risc600 block preview	
- Automatic corner override	G62	
- Chopping function	G81.1	
- Cylindrical interpolation	G07.1	
- Data server		
- Dynamic graphic display (w/10.4 Color LCD)	Machining profile drawing	
- EZ Guide i (Doosan Infracore Conversational Programming Solution) with 10.4 Color TFT		
- Tape format for FS15		
- Increment system 1/10		
- Figure copying	G72.1, G72.2	
- Manual handle feed (1 unit)		
- Handle interruption		
- High speed skip function		
- Inolute interpolation	G02.2, G03.2	
- Look ahead control	G08	
- Machining time stamp function		
- No. of Registered programs	400 / 1000 ea	
- Number of tool offsets	200 / 400 / 499 / 999 ea	
- Optional block skip addition	9 blocks	
- Part program storage	1280 / 2560 m	
- Playback function		
- Polar coordinate command	G15 / G16	
- Polar coordinate interpolation	G12.1 / G13.1	
- Programmable mirror image	G50.1 / G51.1	
- Remote buffer		
- Single direction positioning	G60	
- Stored stroke check 2 / 3		
- Tool load monitoring function (doosan)		
- Tool position offset	G45 - G48	
- Position switch		

\* : Pre discussion required

## VM 560

Heavy Duty Vertical Machining Center



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Machine Tools

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